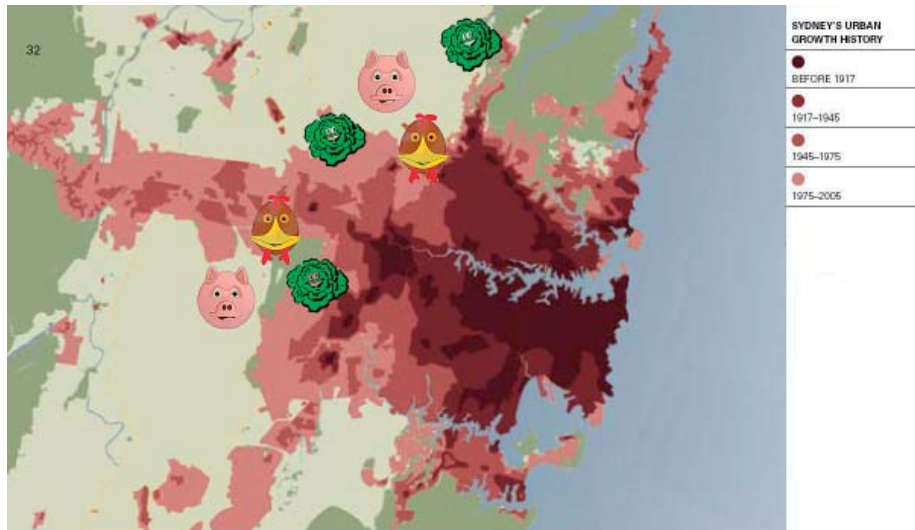


# urban agriculture and planting

Australian Bureau of Statistics figures show that the Sydney region accounts for 20% of the total vegetable production of New South Wales, but between 80-100% of all perishable vegetables and is worth around \$1 billion with flow-on benefits to the state economy of between \$2-\$3 billion. The production base is very diverse with examples including nursery plants, poultry, cattle, horse, alpaca, honey, deer, duck, goat, fish, nuts, oysters, mushrooms and wine.

## urban farming may be on the way to extinction

<http://pacific-edge.info/urban-farming-may-be-on-way-to-extinction/>  
Sun, Jul 13, 2003

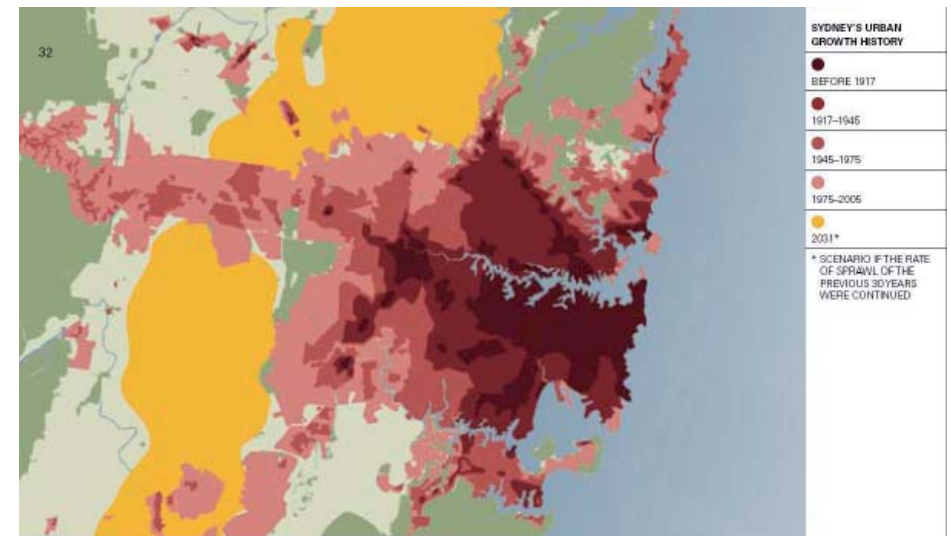


The origin of farming in the Sydney region goes back to the passengers of the First Fleet. The colony's early agriculture moved to the clay soils of the Parramatta region as soon as it was opened by exploration. Farms were established at Rouse Hill and elsewhere in areas that would within 200 years be engulfed by the flood tide of urban expansion. Market gardeners in the Sydney Basin at present farm two geographically distinct pockets:

- \*the Hills to Liverpool area on the south-west urban fringe
- \*the outer Blacktown to Hawkesbury region to the north.

Whether you will be able to continue to eat the region's produce, however, is an open question. Rising land values, urban expansion, a lack of interest among the children of farmers and the need of farmers to finance their retirement are combining to reduce the amount of food produced in the region.

... these areas are experiencing rapid residential and commercial development as Sydney's population expands by up to 1000 a week. The farmland between Parramatta and the Nepean River/Blue Mountains escarpment was long ago consumed by residential development.



images from: [www.metrostrategy.nsw.gov.au](http://www.metrostrategy.nsw.gov.au)

Sydney residents are likely to be faced with an increasing food bill as foods are brought in from further afield. And there are costs other than monetary – increased use of fuel, increased road traffic and food that is less than fresh by the time it is served.

Sydney is fortunate in having its fresh foods – vegetables, fruit, poultry – sourced from its immediate hinterland. Only timely government policy will keep it that way.

Urban agriculture has many forms and this may be why there is a lack of understanding of the phenomenon at all levels of the community, particularly decision makers. Forms of urban agriculture:

- \*Backyard
- \*Community and Communal Gardens
- \*Rooftop
- \*Controlled Environment/High-Tech

One of the values that all forms of urban agriculture has, is the research opportunity it represents to the nation.

## urban agriculture: the new frontier

Ian Knowd, David Mason and Andrew Docking, 21 June 2006



Values of Urban Agriculture

- \*Food Security
- \*Low food miles
- \*Employment Opportunities
- \*Economic sustainability
- \*Social health opportunities

Urban agriculture has intrinsic economic, environmental and social values. These values are all indicators of the relevance of agriculture to contemporary urban environments and form the basis of an argument to retain and/or enhance its contribution to the quality of life in urban environments.



## sydney's agriculture: planning for the future forum outcomes report

NSW Department of Primary Industries, 27 February 2009

### Industry Recommendation:

- \* Promotion and improvements of government approach - state and local governments regarding, planning, protection and management of agricultural land.
- \* Expansion of the Rural State Environmental Planning Policy back into the Sydney Basin - If the SEPP were amended to include land across Sydney it would provide for a consistent approach to the management of agricultural land as a strategic resource across NSW. - Establish a government land holding body to buy-back productive land
- \* Promote community awareness and education - focus of 'employment lands' - Improve food labelling and fresh food branding - to diversify the market and reduce monopoly of supermarkets
- \* Use development controls to promote urban food production - Consideration should be given to promoting productive urban spaces through the introduction of development controls and integrated urban design initiatives in all local government areas that promote alternative food production. - Establish designated green zones and agribusiness precincts in the Sydney basin
- \* Support agricultural research - State and local governments could provide more research incentives to support the agricultural industry, particularly new and emerging agricultural practices, such as the hi-tech greenhouse, organic production industries and vertical farming.

As world leaders grapple with the global financial crisis, another equally threatening international disaster is unfolding - and begging for a co-ordinated international solution. The most acute food shortage in more than 40 years has, according to the World Bank, already left 800 million people "food insecure"... Unlike recent food shortages, it is not confined to sub-Saharan Africa and is not temporary.

## going hungry in the 21st century

Paul Myers, Sydney Morning Herald, December 6, 2008



What has caused the catastrophe? Among the main reasons are population growth, rising affluence coupled with urbanisation and industrialisation in China and India, climate change, a lack of new genetic and technological food production breakthroughs, declining pasture and crop seed banks, international trade barriers, rising energy costs, an increasing diversion of crops to produce biofuels, a shortage of food production specialists in key disciplines, and hefty cuts to developed countries' agricultural aid budgets.

World leaders must address how food production and distribution can be organised and co-ordinated to feed an extra 70 million mouths a year - 2 billion more people - by 2040. "We're back to an equivalent situation to the green revolution in the 1960s," says an Australian food expert, Dr Beth Woods, the executive director of innovation and bio-security investment at the Queensland Department of Primary Industries and Fisheries.

## the vertical farm: reducing the impact of agriculture on ecosystem functions and services

An essay by Dickson Despommier, Department of Environmental Health Sciences, Columbia University, New York

Today, over 800 million hectares is committed to soil-based agriculture, or about 38% of the total landmass of the earth. It is predicted that over the next 50 years, the human population is expected to rise to at least 8.6 billion, requiring an additional 109 hectares to feed them using current technologies, or roughly the size of Brazil. That quantity of additional arable land is simply not available. Without an alternative strategy for dealing with just this one problem, social chaos will surely replace orderly behavior in most over-crowded countries.



Novel ways for obtaining an abundant and varied food supply without encroachment into the few remaining functional ecosystems must be seriously entertained. One solution involves the construction of urban food production centers - vertical farms - in which our food would be continuously grown inside of tall buildings within the built environment.

Other benefits of vertical farming include the creation of a sustainable urban environment that encourages good health for all who choose to live there; new employment opportunities, fewer abandoned lots and buildings, cleaner air, safe use of municipal liquid waste, and an abundant supply of safe drinking water.



## observations and reflections...

### designing with a difference

- \* There is a responsibility of urban planners and architects to address these issues and implement them innovatively in collaboration with government and industry bodies.
- \* Urban planners and architects should change their approach towards food security and urban agriculture. Food security is just as important if not more important than those issues architects are concerned with such as ESD and water conservation. There is a need to shift the focus and promote further research.
- \* Architectural implications – there has been an international interest generated. Schematic schemes are being developed globally at all levels of the architectural industry from students to established firms. A new architectural typology, program and function has been introduced and most designers are seriously attempting to satisfy the programmatic requirements whilst creating a new and interesting architectural forms.
- \* The idea of urban agriculture has seen the start of an architectural discussion – urban agricultural architecture. There has been a response from most major cities around the world all grappling with varied solutions in terms of different agricultural forms, mixed use programming and the scale of these hypothetical projects. Although most projects are well thought out and feasible, none have come to actual realisation yet.

### a scale of responses

cities across the globe are  
architecturally conceptualising the future  
of urban agriculture

# united states of america



project: dragonfly, a metabolic farm  
for urban agriculture

location: roosevelt island, new york

architects: vincent callebaut

The urban keen interest of the beginning of our Century turns toward the garden flat, bringing back the countryside in our over-crowded cities, fighting from now on for a community urban agriculture able to contribute to the durability of the city and to rethink the food production.



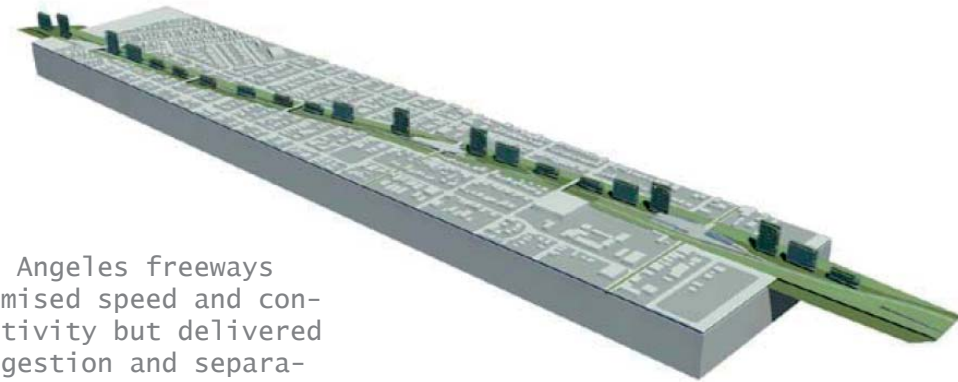
The architecture has to be in the service of this new agriculture and to design this new social desire in this context of ecologic mutation and food autonomy. The Dragonfly project suggests therefore building a prototype of urban farm offering around a mixed programme... farming spaces which are vertically laid out in several floors and partly cultivated by its own inhabitants.



<http://vincent.callebaut.org/page1-img-dragonfly.html>

project: the new los angeles greenway:  
reclaiming our future ruins

location: santa monica freeway, los angeles  
architects: dutton architects



Los Angeles freeways promised speed and connectivity but delivered congestion and separation. We must turn these concrete rivers of frustration and pollution into something good for everyone in the city.

We propose a Slow Move Nation, like the Slow Food Nation. Freeways can be the source of transit and connectivity, as well as parks and valuable green space for an inexorably gray city. Pedestrians, bikes, and light rail will now move along the old freeway routes instead of cars. Furthering the movement toward local community (and reducing the egregious transportation miles required by the global agri-industry), we are reintroducing agriculture to Los Angeles through the construction of vertical farms along the freeway. Community gardens would also be created, and new public squares would be both transit hubs as well as farmers markets.



<http://www.verticalfarm.com/Images/design/greenway/Greenway.pdf>

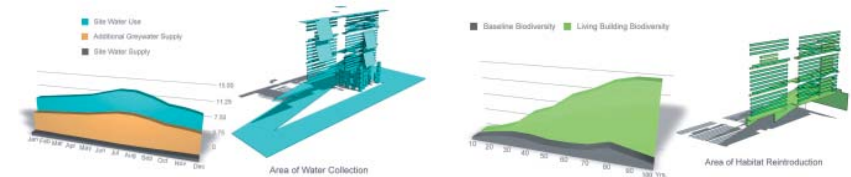




With the goal of self-sufficiency, the CUA is designed to be completely independent of city water even providing its own drinking water. Grey water, as well as rain collected via the structure's 31,000+ sq. ft. rooftop rainwater collection area, would be treated and recycled on site. The filtering and purifying would occur through the use of greenhouses, planters, and biomembrane plants which utilize plants' ability to remove contaminants from water. 34,000+ sf of photovoltaic cells would collect energy, regulated over the seasons by storage as hydrogen gas in underground tanks.

project: center for urban agriculture  
location: downtown seattle  
architects: mithun

Food, water, and energy are the focus of the "Center for Urban Agriculture" design. Agricultural features include fields for growing vegetables and grains, greenhouses, rooftop gardens, and even a chicken farm. Vertical construction allows for the CUA to incorporate more than an acre of native habitat and farmland on the building's .72 acre site. The site would provide 318 small studio, 1- and 2-bedroom affordable apartments.



Once funding is in place for the original architectural proposal, the modules can be easily disassembled and redistributed to various neighborhoods, infilling other empty sites, testing new proposals, and developing initiatives with other communities. Designed with flexibility and reconfigurability in mind, the modularity of the units anticipates future deployments on other sites. An instant architecture, designed with an intention towards its afterlife(s), this is a precycled architecture.



project: eco-pod: pre-cycled modular  
bioreactor for down town crossing

location: boston

architects: howeler yoon architecture

Taking advantage of the stalled Filene's construction site at Downtown Crossing, Eco-Pod is a proposal to immediately stimulate the economy, and the ecology, of downtown Boston. The pods will serve as bio-fuel sources and as micro-incubators for flexible research and development programs. As an open and reconfigurable structure, the voids between pods form a network of vertical public parks/botanical gardens housing unique plant species- a new Uncommon for the Commons.



This is anticipatory architecture, capable of generating a new micro-urbanism that is local, agile, and carbon net positive.

<http://www.hyarchitecture.com/>



"perhaps this project will seek to sustain what might be our richest and most influential resource...the human. All too often we focus on hanging the effect without reviewing the cause."...the project developed into a space that will "fertilize" an old parking lot in the hopes that dormant seeds of retail, commercial, residential and social equality. The proposal hopes to transform the city block into not just a newer city or country, but eventually create "a world that can sustain itself and also rehabilitate and support the people that are a part of that network."

project: reVision Dallas / entangled bank

location: dallas

architects: little studios

"Entangled Bank combines heavy duty technological prowess with artistic integration of systems. The building is designed as a holistic, integrated design...Each unit type was designed, completed with suggested sale price and amount of energy consumption. A wide array of green collar job programs were provided that work with the design of the building to engage residents and educate visitors.



<http://www.archdaily.com/30383/revision-dallas-entangled-bank/>

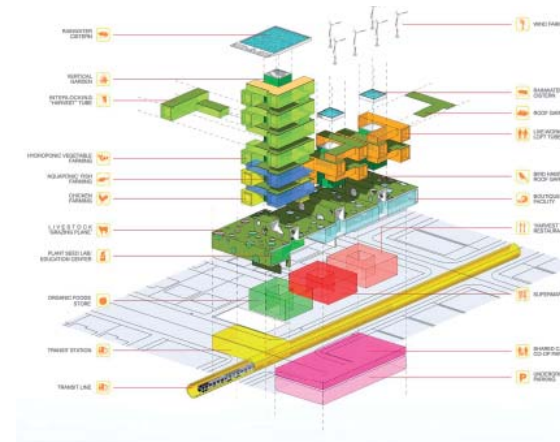


canada

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project: harvest green project 01
location: vancouver
architects: romses architects
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Harvest Green Project explores the notion of the ‘foregrounding’ of new agri-food systems in and around the strategic urban location of an arterial transit hub. To a certain extent, we have seen 20th century town planning disregard the importance of food and farming and urban developement has virtually eliminated agriculture in our cities. Incorporating urban farming prominently into our urban fabric of the city and in a synergistic mixed-use development integrated with transit, is a way to re-assert the cultural and environmental importance of locally produced food to the health and sustainability of the city and its residents.



The urban design strategies for the proposal are predicated on the view that urban food and energy harvesting needs to be 'foregrounded' into strategic and highly visible locations in the city, such as transit hubs along arterials. The 'Harvest Tower' will act as a landmark vertical marker for the development and surrounding neighbourhood, while the commercial/office podium roots the development to the surrounding arterials streetwall context.



If successfully implemented, projects like the Harvest Green Project can offer the promise of urban renewal. Sustainable production of a safe and varied food supply, year round crop production, and the eventual repair of ecosystems that have been sacrificed for large-scale traditional horizontal farming.

project: harvest green project 02  
location: vancouver  
architects: romses architects

Harvest Green Project is rooted in a concept that challenges the status quo of how energy and food is produced, delivered and sustained in our city, neighbourhoods, and individual single-family homes. Taking cues from the City Eco-density Charter, the Harvest Green Project proposes to overlay a new 'green energy and food web' across the numerous residential neighbourhoods and laneways within the city as these communities address future increase densification.

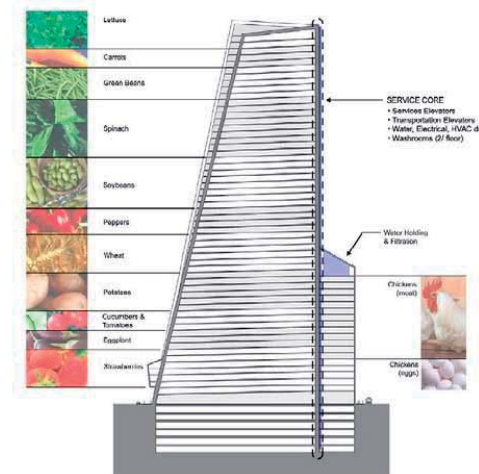


Private and communal rainwater cisterns will provide irrigation for edible green roofs, community and private edible gardens, fruit bearing vegetation and vertical gardens that will inhabit the facades, laneway and yards and spaces between buildings. The goal is for homeowners to re-think the obsession with the suburban lawn in favor of creating 'edible estates'.

Skyfarm is a vertical farm designed by Gordon Graff, a student in the Master of Architecture program at the University of Waterloo. The vertically set farm for Toronto is intent on meeting the needs of a tightly packed planet in the face of a limited food supply, while removing dependence on the food transportation via energy intensive and emission heavy methods.



project: sky farm  
location: toronto  
architects: university of waterloo,  
gordon graff



Instead of soil, Skyfarm's plants float on trays of nutrient-rich water, growing hydroponically over 59 stories stacked half a dozen storeys deep. Farmed within a controlled environment, crops will no longer be subject to the vagaries of climate, infestation, or disease and the dense hydroponic agriculture can guarantee considerable yields

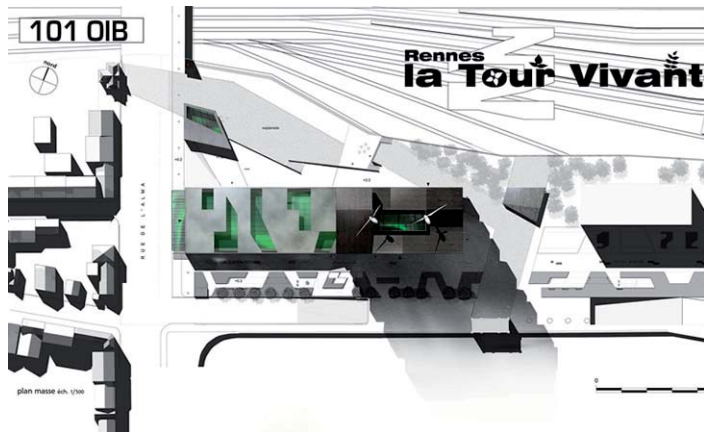


# france



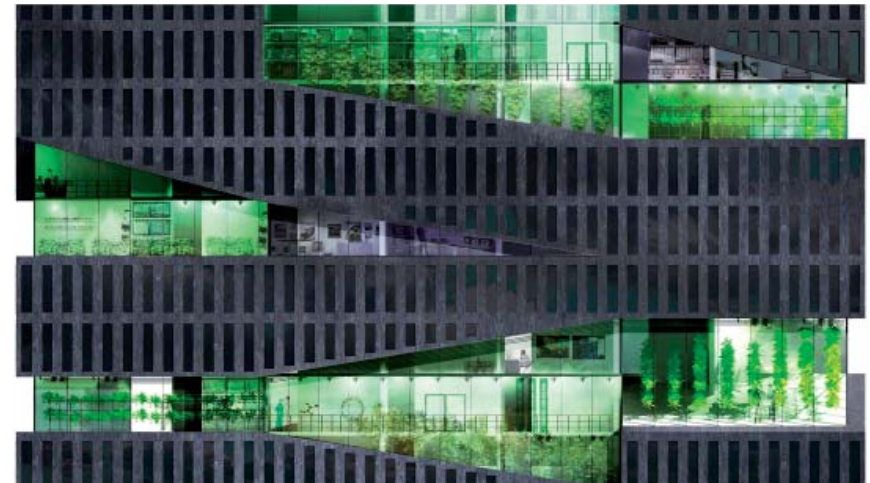
A dense city opposed to a natural landscape comes today with the creation of gigantic places of essential production to the man. These zones outside of the city do not come in any of these categories and give place to increasingly unqualifiable landscapes, destroying the structure of the territory by urban spreading out and polluting the atmosphere by the increasingly important grid systems.

project: the living tower  
location: paris  
architects: SOA architects



The concept of the Living Tower's aim is to associate the agricultural production, dwelling and activities in a single and vertical system. This system would allow to make the city denser meanwhile a greater autonomy could be gained reliance in agricultural plains, reducing the need of transportation between urban and extra-urban territories. The yet unusual superimposition of these programs finally makes it possible to consider new practical and energetic relations between agricultural culture, tertiary spaces, housing and trade inducing a very strong energy saving.

[http://www.ateliersoa.fr/verticalfarm\\_fr/pages/images/press\\_urban\\_farm.pdf](http://www.ateliersoa.fr/verticalfarm_fr/pages/images/press_urban_farm.pdf)



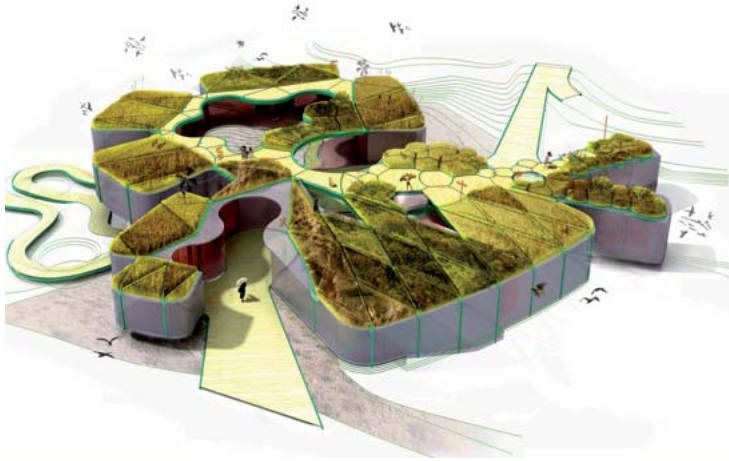
With a topographic game of opposition between full and unfilled spaces, the system of the Living Tower is designed as an autonomous ecological machine which associates places of production, places of consumption and spaces of life. The full spaces systematically fulfill the requirements of housing and the offices, in term of comfort, heat insulation, acoustic and sunning, while the unfilled spaces can adapt to various functions of production.

The typology of the Living Tower declines naturally. The association of full and the unfilled spaces can be carried out on variable heights and shapes. The interweaving creates new spaces in a tower, possibilities of exposures and rich and varied yields.

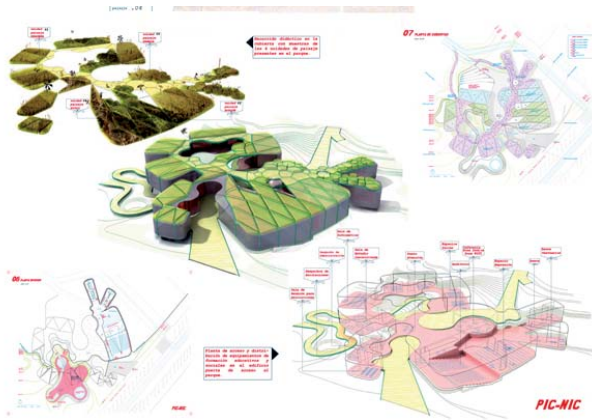




# spain



project: landscape condenser  
location: yecla, murcia  
architects: andres jaque architects



'landscape condenser' by spanish firm andres jaque architects is a proposal for a multifunctional building in yecla, murcia. located in the eastern part of spain, the region is known for producing good grain, wine, oil and fruit. taking this into consideration the architects developed the building with a living roof, where various crops and plants from the surrounding landscape can grow in different sections.

# china

project: agro-housing  
location: wuhan  
architects: knafo kilmor architects

According to a UN report, in 2010 about 50% of the Chinese population will reside in cities. This huge migration from rural regions to new urban megalopolises will create a dramatic cultural and social crisis, a loss of existing traditions and considerable unemployment. Massive urbanization will form random communities, severely deplete natural resources, exhaust urban infrastructures and transportation systems, and will increase air and soil pollution.



The idea behind Agro-Housing is to create a close to home space where families can produce their own food supply according to their abilities and choices. This will allow the citizens more independence, freedom, and additional income.



The concept of Agro-Housing is a new urban and social vision that will address problems of chaotic urbanization by creating a new order in the city and more specifically, in the housing environment. Agro-Housing is a program that combines a high-rise apartment complex with a vertical greenhouse within the same building.

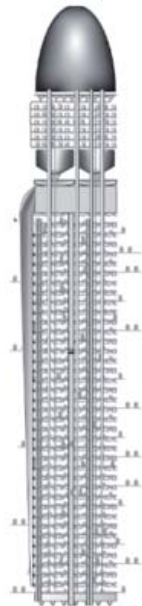
# the netherlands



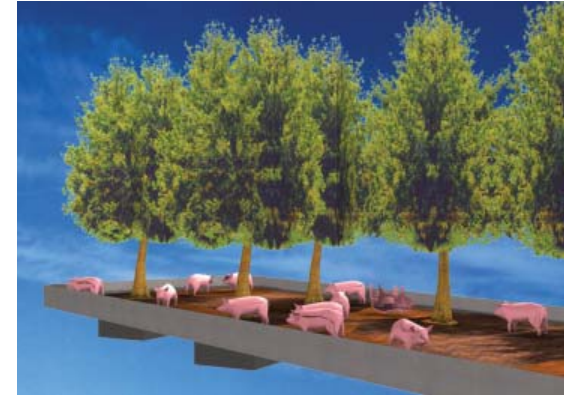
In 2000, pork was the most consumed form of meat at 80 billion kg per year. Recent animal diseases such as Swine Fever and Foot and Mouth disease are raising serious questions about pork production and consumption. It is evident that the current pork industry cannot proceed in the same way without causing many casualties.

project: pig city  
location: rotterdam  
architects: MVRDV

With a production of 16,5 million tons of pork, The Netherlands is the chief exporter of pork within the European Union. In 1999, 15.2 million pigs and 15.5 million humans officially inhabited The Netherlands. One pig needs an area of 664 m<sup>2</sup>, including current food processing: composed of 50% intensive grain production and 50% industrial by-products.



In the case of organic farming, pigs would be fed with 100% grain, leading to a required 130% more field surface due to the reduced grain production. This would cause a demand of 1726 m<sup>2</sup> per pig, including the organic food processing. This would mean that there would be only 774 m<sup>2</sup> per person left for other activities. In other words, 75 % of the Netherlands would be dedicated to pigs.



Can we combine organic farming with a further concentration of the production-activities so that there will be enough space for other activities? Is it possible to compact all the pig production within concentrated farms, therefore avoiding unnecessary transportation and distribution, and thereby reducing the spread of diseases? Can we through concentrated farming, therefore avoiding unnecessary transportation and distribution, and thereby reducing the spread of diseases? Can we through concentrated farming, create the economical critical mass to allow for a communal slaughterhouse, a self-sufficient fertiliser recycler and a central food core, so as to solve the various problems found in the pig-industry?





# australia

project: vf type 0

location: queensland

architects: university of queensland,  
oliver foster

There are definitely some vertical gardening inspiration here in these models - using the low-tech to inspire the high-tech. And speaking of 'high-tech', there's plenty of new models coming forth from the Vertical Farm Project, including these new ones called "VF - Type 0" by Oliver Foster, from the University of Queensland, Australia.



Getting back to the idea of using low-tech to inform the high-tech (or just merely using the insane notion of going back to low-tech...) many countries throughout the world have strong urban agricultural precedents, including recent info from the Philippines, Zambia, the UK, and of course, one of the true models of sustainable urban agriculture - Cuba. A recent article from Havana, via Reuters, is looking into the Cuban resurgence of urban agriculture after successive waves of hurricanes decimated the almost a third of Cuba's plantings.

## Innovative policy on community gardening adopted by City of Sydney

Thu, Mar 11, 2010, [http://communitygarden.org.au/cos\\_policy](http://communitygarden.org.au/cos_policy)

The City of Sydney council is the latest local government to adopt a policy on community gardening. The policy promises City support for the practice of community gardening through: advice and the provision of materials; education and training; other support in the form of local networking between community gardeners, promotion through the City's website, publications and events, facilitation of meetings when needed as well as community engagement processes.

The City policy makes the point that community gardens are only one type of community food initiative. On support for other types of community food systems, the policy raises the possibility of support for community supported agriculture, food co-operatives, farmers' markets, school kitchen gardens, food rescue and aid programs and green roofs. The city will continue in its workshop program of community education in organic gardening, resource recovery and sustainable living.



## sydney a big step closer to realising city farm vision

<http://www.sydneycityfarm.org/0>

Sydney City Council voted unanimously on 23rd Nov 2009, to find a site for a Sydney City Farm. Most likely site will be Sydney Park, St Peters.



## observations and reflections...

\*There has yet to be an overwhelming response within the Australian architectural industry which addresses the concept of urban agriculture. In particular a scheme for the Sydney region has never been proposed by either students nor professionals. A lack of government interest and funding or perhaps a lack of interest from the architectural community may be reasons Sydney has not developed a proposal.

\*Vertical Farms and urban agriculture are projects which have yet to prove their feasibility, but nevertheless a strategy to maintain our food supply is required and can possibly be met through research and smart designing.

\*Urban agriculture in terms of architecture is embedded in politics and economy. It pushes the realm of architecture towards the realm of activism. It gives architecture a new voice of sustenance and self-sufficiency.

\*The integration of architecture and agriculture affects the relationship the public has with their urban surroundings. Skyscrapers, building walls, and roof tops which once were viewed as sterile and overwhelming in size would be re-established as spaces which are 'fruitful' and can be yielded. There will be a humble 'grass roots' relationship between these once vast dormant urban spaces and our dinner plates.

\*We begin to establish a new kind of relationship with architecture and our inescapable urbanity. As we begin to reconnect with our food resources – we begin to view our buildings and urban fabric as a foundation of essential nourishment.

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